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IGME 531 Project 2

What did I make?

For this project, I decided to play around with the Phyllotaxis algorithm. Phyllotaxis means “leaf arrangement” and the algorithm shows the relationship between how the leaves are arranged around a stem.

What did I do?

- **Aesthetics:** For the look of the project, I wanted it to be simple and left to the user. The “petals” start off red but can be changed by using the color picker in the GUI.
- **Algorithm:** The formulas used to find where the next petal should go are

  $\phi = n * \alpha$

  $r = c * \sqrt{n}$

  where ϕ is the “divergence angle”, α is a constant angle that users can manipulate, n ordering number of the petals, r is the distance between the center of the flower and the center of the petal, and c is a scaling number. ϕ and r are then used to find the x and y position of the petal using cosine and sine along with the canvas center x and y positions. The petal pattern produced is typically a spiral pattern and the changing the angle constant, α, can change how the pattern is produced.
- **User Interaction:** The user interaction in this is very simple. Using the GUI, the user is able to adjust the angle used in the algorithm, change the color of the petals, and reset the canvas to start drawing at the beginning.

What are my reasons?

For this project, I decided to use 2D canvas as opposed to a 3D alternative because I figured that pattern produced by the algorithm would be easier to see as a 2D pattern. I really wanted to show off a cool algorithm but still give the user a good amount of control so I enabled them to manipulate pieces of the project via GUI. The angle used in the algorithm can be changed while the canvas is drawing to see how slight changes in the angle can affect how the petals are placed. The user can also reset the canvas which will start drawing the petals in the center but with the current angle. This allows for people to easily see how a specific angle might look like from start to finish.